SUMMARY

Thiya Fiantika, *Department of Civil Engineering, Faculty of Engineering Brawijaya University, May 2018, Probability Analysis of Residual Slope Instability with Variation of Slope Angle. Supervisors: Eko Andi Suryo dan As'ad Munawir.*

Slope is (part of) the side of a hill or mountain. Slope stability became the main concern while working on a construction project, especially on road/highway project. To measure the stability of the slope, it requires an analysis that produce a save number of the slope that involve a deterministic method. Slope stability determined by soil parameters which include: physical & mechanical behavior of the soil, ground water level, rock mass structure, etc. Because there is an uncertainty on parameters value in the slope design, causing the slope vulnerable, it needs a concept such as probability analysis to find the stability of the slope.

Probability analysis is a way to determine the safety factor by using parameters as a random variable, which the result of safety factor became a random variable as well. In this process the parameters used are: volume, cohesion, frictions angle and safety factor gained by using normal distribution. Probability analysis could be obtained by using Monte Carlo Simulation on Geostudio SLOPE/W 2018 software. In this analysis there are three trials conducted with various slope angle along with similar material, so the result would be comparable at which angle the slope stay stable. The soil data are taken from prior research located in Gunung Banyak, Batu, East Java. Analysis could be performed by calculating the safety factor and probability of failure on the real slope then changing the slope angle to analyzing the safety factor and probability of failure of the slope.

The result from calculating safety factor using Geostudio SLOPE/W 2018 software shows 1,082 as the safety factor with 10,48 % of probability failure for real slope. For second trial with different angle of the slope based on height and weight comparison produce a safety factor value by 1,089 and 10,69 % probability failure. And last trial with different angle of the slope but without height and weight comparison produce a safety factor less than one, it shows 0,938 for the safety factor and 82,15 % probability failure. Height and weight comparison indicate the steepness of the slope. From this analysis, it can be concluded that the steeper the slope, the bigger probability of failure will occur.

Keywords*: safety factor, probability analysis, Monte Carlo simulation*

(Halaman ini sengaja dikosongkan)